

PRE-CONFERENCE WORKSHOP

Geotechnics for High-Speed Railways (HSR): Practice and Lessons Learned from Japan and China

25 November 2026 · Wednesday • 8:00 – 12:00 • National Convention Center (NCC), Hanoi, Vietnam

— SPEAKERS —



Dr. Yoshitsugu Momoya
Railway Technical Research Institute, Japan



Dr. Susumu Nakajima
Railway Technical Research Institute, Japan



Dr. Cai Degou
China Academy of Railway Sciences Co., Ltd, China

SESSION 1 Geotechnics for High-Speed Railways in Japan

Presenters: Dr. Yoshitsugu Momoya & Dr. Susumu Nakajima — Railway Technical Research Institute, Japan

TIME	TOPIC	KEY POINTS
8:00 – 8:15	**Introduction of HSR in Japan and design practice**	• Overview of HSR development and design specifications/standards in Japan
8:15 – 9:00	**Design of ballasted tracks, slab tracks and subgrade**	• Comparison between ballasted track and slab track systems • Challenges of ballasted tracks on soft roadbeds and subgrades • Roadbed and subgrade design and specifications • Applications of slab track systems on earth structures
9:00 – 9:15 · Q&A and Tea Break		
9:15 – 9:45	**Case studies of Japanese HSR (Shinkansen)**	• Natural environment of Japan — seismic-prone country, frequent heavy rain • Geotechnical challenges in Shinkansen construction, especially on weak subsoil • Composition ratio of HSR structures — drastic reduction of earth structures and its recovery following new technology • Lessons from the first-generation Shinkansen (Tokaido Shinkansen) — demanding maintenance from continuous settlement/deformation due to rainfall and earthquakes
9:45 – 10:15	**Evolution of geotechnical structures for HSR in Japan**	• Development of Geosynthetics Reinforced Soil (GRS) structures — GRS wall, GRS bridge abutment, GRS integral bridge • Application of reinforced soil structures in recent Shinkansen construction — Hokuriku, Kyushu and Hokkaido lines
10:15 – 10:30 · Q&A and Tea Break		

SESSION 2 Geotechnics for High-Speed Railways in China

Presenter: Dr. Cai Degou — China Academy of Railway Sciences Co., Ltd, China

TIME	TOPIC	KEY POINTS
10:30 – 11:00	**Introduction of HSR in China and design practice**	• Overview of China's HSR development • Core requirements for HSR lines in China — smoothness, stability and deformation/settlement control • Core challenges in geotechnical engineering • Functions and performance requirements • Deformation control-based design
11:00 – 11:45	**Foundation methods and case studies**	• Foundations for different ground conditions — soft/loose soils, expansive soils, karst formation • Foundation methods for 2 case studies: (1) Beijing–Shanghai HSR line; (2) Shanghai–Kunming HSR line
11:45 – 12:00 · Q&A		